Tools of the Trade: An Overview of Information Technology used for Disease Surveillance and Investigations

Ryan Sachs, MPH

MCDH
MCHENRY COUNTY DEPARTMENT OF HEALTH
Promoting Better Health Since 1966

Outline

- REDCap
- SAS 9.4
- ESSENCE

REDCap

What is it?

- Secure web application for building and managing online surveys and databases
  - No technical knowledge or prior experience needed
  - Instructional texts and prompts provide guidance every step
  - Tutorial videos available
- Can be used to collect almost any type of data
- Geared to support online/offline research studies and operations

What can it do?

- Quickly and easily build data collection instruments
  - Databases or Surveys (or combination)
  - Built online in real-time (through Online Designer) or offline (through Data Dictionary)

Types of projects

- Traditional project (classic model with data entry forms)
- Single survey project
- Longitudinal project (multi-use data entry forms, abstract time-points)
- Longitudinal project + scheduling (multi-use data entry forms, defined time points)
- Operations (non-study/not-trial projects, i.e. operational bookkeeping information)
- List not exhaustive
- Project features can be mixed and matched

Uses and benefits for disease surveillance and investigations

- Uses
  - Outbreak Investigations
    - Ex: Norovirus Outbreak
  - Individual Case Tracking
    - Ex: Measles
- Benefits
  - Cuts down on person time
  - Easier data management

Demo

- https://redcap.dph.illinois.gov/

SAS 9.4

What is it?

- Program used for performing statistical analyses
  - Uses coding within the SAS environment to perform procedures
    - Examples: proc freq, proc means, proc logistic
  - Added functionality compared to Microsoft Excel and Epi Info
  - Similar to STATA, R, and Python
- Requires more advanced technical knowledge and experience
  - Unique programming language
  - Statistical procedures

What can it do?

- Data management
  - Can be used to create, import, and modify data sets
- Statistical analyses
  - Functionality for basic => advanced procedures
    - Examples: T-tests, Chi-square, Odds Ratio, Relative Risk, Simple Regression, Multiple Regression
- Tables, Graphs, and Maps
  - Can create custom tables, graphs, and maps

Uses and benefits for disease surveillance and investigations

- Uses
  - Outbreak Investigations
    - Ex: Norovirus Outbreak
  - Syndromic surveillance
    - Ex: School Absenteeism Surveillance
- Benefits
  - Can perform complex statistical analyses in short time frame
  - Once code is created, anyone can run (with basic understanding of program)
  - Easier to modify data compared to Microsoft Excel
  - Higher functionality compared to Microsoft Excel and Epi Info

Electronic **S**urveillance **S**ystem for the **E**arly **N**otification of **C**ommunity-based **E**pidemics (ESSENCE)

What is it?

- Part of the National Syndromic Surveillance Program (NSSP) Platform offered through CDC's BioSense Platform
- Web-based disease surveillance information system
- Developed to alert Health Authorities of infectious disease outbreaks, including possible bioterrorism attacks
- Syndromic Surveillance of Hospital ED Visits
  - Hospital Sentinel Sites (4 in McHenry County)
- Requires training to use

What can it do?

- Patient chief complaint data => Categories and Sub-categories
- Custom queries
- Data details
  - Chief complaint, discharge diagnosis, triage notes, demographic info, and other useful info
- Time series graphs
  - ED visits over time
- Mapping at the zip code level
- Custom alert creation

Uses and benefits for disease surveillance and investigations

- Uses
  - Situational awareness
  - Outbreak detection
  - Case detection
    - Ex: Rabies Exposure, Chicken Pox
  - Opioid surveillance
  - Emergency response
- Benefits
  - Early detection of outbreaks
  - Case finding for rare conditions

Demo

- https://essence.syndromicsurveillance.org/

Questions?